

Industrial Management Review

Alfred P. Sloan School of Management
Massachusetts Institute of Technology

Volume 8, Number 2

Spring 1967

Editorial		1
Facts and Folklore in Research and Development Management	Edward B. Roberts	5
Unprogrammed Decision Making	Peer O. Soelberg	19
Stochastic Modeling of the Consumer	David B. Montgomery	31
Sprinter: A Tool for New Product Decision Makers	Glen L. Urban	43
The Use of Simulation in Selecting Branch Banks	E. Eugene Carter and Kalman J. Cohen	55
The Science of Strategy-Making	Henry Mintzberg	71
The Technological Gap	Richard S. Morse	83
Company Performance and Interpersonal Relations	Robin W. Willits	91
Coming of Age in the Social Sciences	Mason Haire	109
The Problem of Moral Education for the Business Manager		119
Book Reviews		129

The Science of Strategy-Making

Henry Mintzberg
Massachusetts Institute
of Technology

Abstract

A science of strategy-making will evolve from greater understanding of the methods used by managers to make strategy, and from the development of more powerful planning programs. Using Simon's intelligence-design-choice structure, we review two views of managerial strategy-making — "muddling through" and entrepreneurship — and six existing planning programs — forecasting, market research, systems analysis, mathematical modeling, capital budgeting, and integrated strategic planning. It is necessary to conclude (1) that planners, lacking powerful programs and the proper information, have to date played a minor role in strategy-making; (2) that planners must concentrate, in the near future, on *ad hoc* analyses rather than on the development of plans; and (3) that the development of useful planning programs will be preceded by more research on how the manager makes strategy.

Introduction to Strategy-Making

Man's beginnings were described in the Bible in terms of conscious planning and grand strategy. The opposing theory, developed by Darwin, suggested that no such grand design existed but that environmental forces gradually shaped man's evolution.

The disagreement between the biblical and Darwinian theorists is paralleled on a more mundane level in the study of strategy-making. There are those who envision grand calculated designs for the corporate entity, and there are those who cite current practice to argue that organizational strategy evolves, shaped less by man than by his environment.

This paper is written in an attempt to review and draw together the various views of strategy-making in organizations. Strategy-making is defined simply as the process of making important organizational decisions (e.g., to reorganize, develop a new product line, embark on an expansion program). Strategy is the sum total of these decisions, and may evolve as *independent* decisions are made over time, or may result from the process of making *integrated* decision plans.

We shall begin the paper by describing the manager as strategy-maker, from both entrepreneurial and "fire-fighting" points of view. We shall then focus on the planner in order to investigate the role of formal analysis in the strategy-making process. Specifically, we shall discuss planner "programs," systematic sets of procedures to produce answers to specific strategy questions. These programs will be classified as "adaptive" or "integrative," depending on whether they are designed to help the manager make independent decisions, or to develop integrated decision plans. Four of the most common adaptive programs — forecasting, market research, systems analysis, and mathematical modeling, and two integrative programs — capital budgeting and integrated strategic planning — will be discussed.

This paper is written for two groups: the manager interested in understanding the programs and problems of the planner, and the planner interested in investigating the differences between his approach and that of the manager. A framework is developed

with which to view these approaches to strategy-making.

A Framework for Strategy-Making

Intelligence-Design-Choice Activity

A proper understanding of the strategy-making process will require a decision framework. We shall use the intelligence-design-choice framework:¹

Intelligence activity sets the stage for a strategic decision by discovering a problem in need of solution or an opportunity available for development. In general, intelligence activity involves scanning the environment and collecting and analyzing information on various trends.

Design activity begins once the area of action has been determined by intelligence activity. The two stages of design activity are search — inventing, finding, and developing alternative means of solving the problem or of exploiting the opportunity — and evaluation — determining the consequences of using these alternatives.

Choice activity is concerned with choosing one from the alternatives that have been developed and evaluated. The “integration” of the various strategic decisions into a unified strategy is included in this category.

Although the intelligence, design, and choice activity are clearly delineated above, such is not always the case in practice. For example, a manager may first decide what he wishes to do and then develop alternatives and analyses to rationalize his choice. Nevertheless, the framework is a basically useful one for classifying strategy-making activity.

A working framework requires two further distinctions — that of the manager versus the planner and that of adaptive versus integrative programs.

Manager versus Planner

For purposes of illustration an overly sharp distinction is made in this paper between managers and planners. Managers will be viewed as those who must maintain the organizations that they head. They must react quickly to the variety of pressures, informa-

tion, problems, and opportunities that continually bombard them, and they must, therefore, work informally. Planners are assumed to be autonomous and analytical, prepared to invoke a formal program when the need arises. Thus we shall assume in this paper that managers do not plan, and that planners do not manage.

One may compare the informal approach of the manager with the programmed approach of the planner by using the intelligence-design-choice framework. Managers are continually performing *intelligence* activity as they interpret the natural flow of information (magazines, opinions of subordinates, newspaper reports, etc.), while planners use mathematical and behavioral theories to study environmental changes (e.g., forecasting, market research). *Design* activity takes place as managers debate new alternatives in the board room, or as an operations research team delves into a problem. *Choices* may be made informally in the mind of one man, or formally, by a capital budgeting program which chooses the highest return-on-investment alternatives.

Adaptive versus Integrative Programs

Each formal planner program will be categorized as either “adaptive” or “integrative.” Using an adaptive program, the planner responds to one specific stimulus and works in “real-time” with the manager. For example, a market research program may be invoked to study a new product opportunity currently facing a company, or a planner’s model may be used during labor negotiations to determine the cost of various strategies.

Integrative programs are not related to specific stimuli. They are invoked by the clock (usually annually), and they draw together a large number of problems and opportunities to work out one integrated plan. The capital budgeting procedure is an integrative program, since all proposed projects are approved, not when they are first conceived, but during the annual budget review.

Before discussing the various planner programs, we shall investigate the methods that managers use in developing strategy.

The Manager as Strategy-Maker

“Intuition” and “judgment,” terms we use to suggest that the mind houses some pro-

¹ This trichotomy is presented in [9].

cesses that are still mysterious to us, are probably the most valid words for describing the contemporary strategy-making process. In other words, the strategy evolves in the mind of the chief executive without ever being explicitly stated, and without the aid of formalized procedures. Anthony discusses possible reasons:

Strategic planning is essentially *irregular*. Problems, opportunities, and "bright ideas" do not arise according to some set timetable; they have to be dealt with whenever they happen to be perceived. The appropriate analytical techniques depend on the nature of the problem being analyzed, and currently there is no general approach (such as a mathematical model) that is of much help in the analysis of all types of strategic problems. Indeed, any attempt to introduce a systematic approach is quite likely to dampen the essential element of creativity.

Few companies have a systematic approach to strategic planning. Most companies react to changes in their environment *after* they experience the changes; they do not have an organized means of attempting to foresee changes and to take action in anticipation of them.²

This describes the context in which the manager operates, but it tells us little about his methods. Two pictures, one painted by Charles E. Lindblom and the other by Peter F. Drucker, provide some insight into managerial methods.

Lindblom's "Muddling Through" Manager³
Lindblom describes the manager who "muddles through," a passive individual with no clear goals. He acts only when forced to, and then he can only consider a few convenient alternatives, each of which will cause only small, non-disruptive changes in his organization. He is careless in evaluating the consequences of each alternative, considering only those which are important, interesting, and easily understandable. Furthermore, he examines only the marginal consequences, making no attempt to "comprehend strictly and literally present states of affairs or the consequences of present policies. . . . He attempts no more than to understand the respects in which various possible states differ from each other and from the status quo."⁴ In Lindblom's opin-

ion the analytical approach to strategy-making — careful analysis of many alternatives in terms of explicit goals — fails because it does not recognize man's inability to cope with complex problems, the lack of information, the cost of analysis, the problems of timing, and the difficulties of stating realistic goals.

Drucker's Entrepreneurial Manager⁵

At the other extreme the manager is depicted as an entrepreneur, controlling his environment, actively searching for significant opportunities, and relating them to his vision of strategy. Perhaps more than any other management writer, Drucker speaks for the entrepreneurial manager:

Entrepreneurship is essentially the acceptance of change as an opportunity and the acceptance of "the leadership in change" as the unique task of the entrepreneur. Entrepreneurship in effect means finding and utilizing opportunity. It is opportunity-focused and not problem-focused. Management deals with problems. Entrepreneurship deals with opportunity.

The entrepreneur is the systematic risk-maker and risk-taker. And he discharges this function by looking for and finding opportunity.⁶

Although the descriptions of the entrepreneurial manager tend to be vague, they leave little doubt about the writer's belief in his freedom to act.

The Composite Manager

The above two views leave much to the imagination. In one case we see the manager sitting at his desk, somewhat harassed, hoping for a moment of relief. In the other case the manager, free of problems, roams the world searching for grand opportunities, returning occasionally to implement painlessly the best of his discoveries.

However overemphasized, these views do help us to piece together a theory of managerial strategy-making:

1. Strategy evolves. An organization's strategy changes over time as managers make new significant decisions.
2. Strategy results from two kinds of *intelligence* activity. Certain strategic decisions are motivated by problems forced on the manager; others result from entrepreneur-

² See [2], pp. 38-39.

³ See [4], Chapters 1-6.

⁴ See [4], pp. 85-86.

⁵ See [5].

⁶ See [5], pp. 8-11.

ship — management's active searching for new opportunities.

3. Strategy decisions are not scheduled; they are made when problems and opportunities happen to occur.

4. Because it is not possible to predict with accuracy what problems and opportunities will arise, it is extremely difficult to integrate different decisions into an explicit, comprehensive strategy.

5. Managers are busy people with many demands on their time. In effect, they are continually bombarded with information, ideas, and problems. Furthermore, the strategy-making environment is very complex. Therefore managers are unable to delve deeply into analysis of strategy questions. It may be concluded that *design* activity — development of alternatives to solve problems and evaluation of the consequences of these alternatives — is generally conducted without precision.

6. Managers have no rigid programs for handling given issues. Each strategic *choice* is made in a different context with new and uncertain information. The manager may have a loose vision of the direction in which he would like to take his organization, and, in an imprecise way, opportunities are evaluated in terms of this vision. But problems are not handled in terms of the vision. When a problem arises, the manager is primarily concerned with reducing the pressures that are acting. Any convenient means of solving the problem will satisfy him.

7. The manager alternates between opportunity-finding and problem-solving. To the extent that problems occur infrequently, and to the extent that the manager is effective in finding relevant opportunities, his vision of organizational strategy is turned into reality.

Once stated, these are simple, almost platitudinous notions of strategy-making. Nevertheless, we shall make practical use of them in the concluding sections.

Adaptive Programs

Recognizing the manager's time constraints and the complexity of strategic decisions, planners have developed a number of programs to aid the manager in his quest for opportunities and his efforts to solve problems. In this section we discuss the adaptive programs: forecasting, market research, systems analysis, and mathematical modeling.

Forecasting

Because of the complexities of environmental changes, many large corporations have turned to forecasting as an analytical method. Using various mathematical techniques ranging from arithmetic to Markov process models, the forecaster attempts to predict economic growth, market growth, product demand, resource availability, and so on. This data is fed to the manager, who uses it to determine the problems that will face the organization, and the opportunities that are available. As such, forecasting is straightforward *intelligence* activity. The first phase of forecasting, trend determination, is a well-developed science. The second phase, analyzing the trends to determine problems and opportunities, does not appear to be highly programmed and is, therefore, often left to the manager.

Market Research

Market research, broadly defined, is concerned with the study of various aspects of a company's marketing functions. This involves *intelligence* activity — studying the product line and the company's markets to determine specific marketing problems and opportunities; and *design* activity — searching for and evaluating product, promotion, and price alternatives.

For example, a market research group in an airline company may conduct a study of the travel market and discover that the customers are discouraged by city-to-airport transportation. This defines a problem area for the management. A series of interviews may establish that passengers believe that helicopters and subways are desirable alternative means of transportation. Finally, the market researcher may partially evaluate the alternatives by determining the demand curves as a function of city-to-airport travel time.

Market research is a useful and well-developed set of programs. From a management point of view, however, market research information must first be related to a wealth of other information (e.g., finance and manufacturing information) before decisions can be made. In general, market research studies tend to be *ad hoc*, and management is left to relate them to each other and to the over-all strategy picture.

Systems Analysis

A number of organizations have developed

special groups, under the title "Systems Analysis" or "Operations Research," to conduct *ad hoc* studies of individual strategy problems. These groups tend to conduct relatively intricate analyses and, thereby draw fairly tight bounds around their studies.

In the early 1950's the Rand Corporation developed the idea of applying the operations research approach of problem-solving to strategic problems. The emphasis was on military problems, and the approach came to be called "Systems Analysis." Hitch and McKean have outlined the role and methods of systems analysis in their book, *The Economics of Defense in the Nuclear Age*.⁷ When Robert McNamara became U. S. Secretary of Defense, he hired Hitch to implement the book's recommendations.

Systems analysis is the natural outgrowth of the economic or "rational" approach to decision-making. The analyst takes a problem defined by management and begins by studying the objectives of the organization in terms of the problem. If the problem for a Department of Defense systems analyst is "developing a defensive strategy to protect against nuclear attack," the objectives may be defined as "minimizing death and property losses." The next step is to develop criteria to measure the consequences of alternatives. In this case the criteria might be "number of lives lost, and dollar value of property destroyed." The analyst then develops alternatives — in this case, perhaps, (1) an anti-missile system, and (2) a series of fallout shelters. Each alternative is evaluated in terms of each criterion. Thus, management would be told the extent of human and property losses given that either system was available during nuclear attack.

Systems analysis is most well-developed in the area of evaluation, where extensive use is made of statistical and economic concepts. The key concept employed is "cost-benefit," which assesses the greatest benefit for a given cost (e.g., number of lives saved for a ten billion dollar expenditure), or the minimum cost for a given benefit (e.g., cost of keeping property losses to 100 billion dollars).

Secretary McNamara has received much publicity for allowing "whiz kids" to become involved in high-level defense strat-

egy-making, and, no doubt, this publicity will eventually influence many business organizations. However, the number of firms using systems analysis to study *strategy* problems is probably quite small at the present time. One such firm is General Electric, which has set up a group numbering 300, called "Tempo," to conduct analyses on a consulting basis for various parts of the organization.⁸

With respect to the role that systems analysts actually play in strategy-making, four criticisms may be put forth:

1. The problems to be studied are initially defined by management. No programmed procedure for problem-finding (i.e., *intelligence* activity) exists.
2. The studies are actually formal means of suboptimizing. Generally each study is independent; no means are used to interrelate various studies.
3. While it is well known that systems analysts generate alternatives, nowhere in the literature is there any mention of how search is conducted. It must be concluded, therefore, that the analyst's search procedures are no more programmed than the manager's search procedures.
4. Systems analysts are quick to state that they do not make choices, rather that they clarify the issues and analyze the alternatives such that management's job of making choices is easier. *Choice* activity implicitly involves trading off objectives in deciding between alternatives (e.g., the anti-missile system saves more property, but the shelter system saves more lives) and the analyst has no means of guiding the manager in these decisions.

Given these four deficiencies, it must be concluded that systems analysis is essentially *design* activity, and is concerned mainly with evaluating alternatives in the context of specific strategy problems.

Mathematical Modeling

Mathematics is a rigorous language, and the ability to use it in describing a situation indicates high-level understanding of the subject concerned. It is, therefore, not surprising that little use is made of mathematical models in the process of strategy-making.⁹ Nevertheless, much research work

⁷ See [7].

⁸ See [13].

⁹ See [10].

is being done in this area, and there is little doubt that the importance of modeling will increase.

Mathematical modeling serves one basic purpose in the development of strategy. It provides to the manager a simulated environment in which he may determine the consequences of different strategies before actually implementing them, or ascertain the consequences of various environmental changes before they occur.

PERT and Industrial Dynamics represent two extremes in model building. The PERT system represents the times taken to complete, and the interrelationships among, the various activities of a project. It is used primarily as a device to plan and control the scheduling of a project. With a PERT model, NASA management is able to determine, for example, the effect of a strike on a scheduled satellite launching, or the effects of different testing procedures on the completion of the Apollo program. Industrial Dynamics employs feedback theory in the building of dynamic models of a firm's environment and operations. For example, if sales, inventory and production parameters are built into the model, management can assess the effects of a change in inventory rules on company performance.

Basically, mathematical modeling is used in the *design* phase of strategy-making to evaluate alternatives. To be accepted by management, models must be recognized as accurate. Unfortunately, at present we have so little understanding of the strategy environment that it is not possible to be optimistic about the widespread development of accurate and useful models in the near future.

In this section we have shown how certain programs are used to increase the power of the manager while he makes strategy. Forecasting collects data on environmental trends and presents it to the manager in systematic form, leaving the manager to decide what the problems and opportunities are. Market research is used to define problems and opportunities in the marketing area and may be used as well to generate marketing alternatives and to evaluate them. Systems analysis is programmed problem solving, with its real usefulness lying in its evaluation procedures. The Mathematical models that are available are used to determine the consequences of par-

ticular strategies or the impacts of possible environmental changes.

Integrative Programs

In addition to the adaptive programs described in the previous section, programs have been designed to develop strategic plans, that is, to make a number of different strategic decisions at one point in time. In theory, these programs replace managerial intuition with fully formalized decision-making procedures. In this section this premise is investigated by analyzing two plan-producing programs: capital budgeting and integrated strategic planning.

Capital Budgeting

Capital budgeting was probably the first programmed procedure used in the determination of strategy, and it is probably the most widely used today. Ideally, the program works as follows: The various division managers of an organization determine that certain projects, such as building a new plant or marketing a new product, are worth considering. The added operating costs and revenues (or savings) which would result from the project are predicted. Net revenue for each year of the project life is determined, and this flow of funds is discounted. By comparing the resultant revenue with the investment necessary to start the project, a return-on-investment (ROI) figure is calculated. The headquarters' executives then review all the divisional proposals and accept, within the total budgetary constraint, the most profitable ones.

Two criticisms of Capital Budgeting may be presented:¹⁰

1. Choices are really made, not by headquarters' executives using the ROI figures, but by division executives. Knowing that the cost and revenue data are very inaccurate, they can choose to propose any project and make it look profitable.
2. The one choice criterion, return-on-investment, is inadequate. It presupposes that all information relevant to the choice can be reduced to monetary terms. Social objectives, and risk and timing factors are therefore usually ignored.

One recent improvement has been "planning by mission." In the early 1960's, Theo-

¹⁰ For two recent criticisms see [3] and [12].

dore Leavitt¹¹ argued that companies should think about the service they perform rather than the products they produce (e.g., providing energy, not refining oil). Robert McNamara made popular this notion when he changed the Department of Defense budgeting system from one based on a departmental allocation (Army, Navy, etc.) to one based on a mission allocation (Strategic Retaliatory Forces, Civil Defense, etc.). This allowed for a more objective analysis of projects, since funds were no longer allocated along divisional lines.

Another variation in the McNamara system, called planning-programming-budgeting, replaces the return-on-investment criterion with a cost-benefit criterion. This aids governmental organizations, which are frequently unable to state project benefits in dollar terms. Here, systems analysis is used to compare similar projects in cost-benefit terms, and strategic choices are made on such a basis. The problem of multiple criteria is not solved, however, for no means are available to compare projects across missions. For example, although President Johnson wishes to extend planning-programming-budgeting to the entire government, he has no analytical means by which to decide how much to allocate to a poverty project as compared to a military project. A common benefit measure (i.e., some measure of the "social good") would have to be developed first to afford a means of comparison.

Capital budgeting is an integrative program because it is designed to make a series of strategic decisions at one point in time. All major projects for the year are accepted or rejected when the funds are allocated. Unfortunately, the capital budgeting program is of marginal use in making strategic decisions. The *intelligence* activity and the search phase of *design* activity are not part of the program. The program formalizes (1) the evaluation phase, by evaluating each proposed alternative on a cost-benefit or ROI basis, and (2) in theory, the choice phase, by using the firm rule of choosing only the highest payoff projects. The program loosely integrates the alternatives by ensuring that, taken all together, they do not violate a budgetary constraint. Other

than this, however, no attempt is made to relate one project to another.

Integrated Strategic Planning

The planning process reaches its highest degree of sophistication when the planner has available a well-defined program for designing corporate strategy. He would follow his formal procedure, much as an engineer does in designing a bridge. The result would be a unified strategic plan. A number of theorists have been working on such programs, and their work should, at the very least, provide more insight into the strategy-making process.

Gilmore and Brandenburg¹² propose a four-part program comprising (1) reappraisal, (2) economic mission, (3) competitive strategy, and (4) program of action phases. H. Igor Ansoff,¹³ presents a highly detailed procedure for making expansion-diversification plans.

The integrated strategic planning programs usually make use of the intelligence-design-choice framework and frequently consist of some variant of the following:

1. Quantitative objectives are stated by management. For example, the organization may choose 8 per cent profit and 3 per cent growth as objectives.
2. The strengths and weaknesses of the organization are studied.
3. Environmental trends (e.g., economic, social, competitive trends) relevant to the operation of the organization are investigated.
4. The information collected in steps 2 and 3 is used to define problem and opportunity areas. For example, a shift in consumer tastes may indicate a problem or an opportunity for a company, and an exploitable strength may give rise to an opportunity. Thus, IBM, with its strengths in designing and selling tabulating equipment and its recognition of the trend toward high-speed computing equipment, was able to enter the computer industry at an opportune time.
5. Given the listing of problem and opportunity areas, the next step is to generate alternatives to solve the problems and exploit the opportunities. Thus, if the company organizational structure is recognized

¹¹ See [8].

¹² See [6].

¹³ See [1].

as a weakness, a number of alternative structures are proposed. If oceanography is recognized as an opportunity area, a technological company may generate a number of alternative types of sea-water recording instruments that it is capable of producing. 6. By combining the various alternatives in each of the problem and opportunity areas, a number of alternative unified strategies are developed. Thus the technological company may decide that one organizational structure suits the production of one type of oceanographic equipment, while a different structure will be necessary to produce and market another type of equipment.

7. The next step is to evaluate each unified strategy in terms of the organizational objectives developed in step 1. It may be determined, for example, that one strategy will satisfy the growth objective, but fall short on the profit objective.

8. The strategy that best satisfies the objectives is chosen.

While this description of the planning program may seem vague and inadequate, it does by and large represent the state of the art. Effective means are available to tabulate strengths, weaknesses and environmental trends, but there exist no subprograms for detailing the search (step 5) and integration (step 6) phases. The planner who applies the integrated strategic planning program finds himself using his intuition in much of his work. Indeed, asking the planner to develop strategic plans today is tantamount to letting him "muddle through" instead of the manager.

Another issue open to debate is step 1, the statement of objectives. Those who favor this step argue that explicit quantitative objectives serve to guide subsequent planning steps. The counter argument questions the stating of objectives at the outset. Management may say that it wants 20 per cent profit and 10 per cent growth, but analysis may indicate that these objectives are unrealistic. It may be found, for example, that one alternative strategy offers 2 per cent profit and 13 per cent growth, while the other offers 6 per cent profit and 8 per cent growth. Management determines the true corporate objectives — the relative preference for growth over profit — when it chooses one of these strategies over the other. But management cannot state this preference in the absence of actual alterna-

tives. Thus it may be concluded that objectives cannot be inputs to the analysis, rather they result from the analysis.

In this section two integrative programs have been discussed. Capital budgeting ostensibly uses a return-on-investment (or cost-benefit) criterion to accept or reject various proposals, while integrated strategic planning presents a vaguely defined set of steps to produce unified strategic plans.

Summary

Table I summarizes the various views of strategy making presented in this paper. A survey of the chart will show that a wide variety of organizational strategy-making behaviors are possible. The two extremes, the "muddling through" manager and integrated strategic planning, represent the difference between the totally passive, judgmental approach and the active, quasi-programmed approach. In reality, any large organization would use different mixtures of the programmed and managerial approaches, depending on the particular situation at hand. Consider the following examples:

A problem faces the manager ("muddling through" manager). He asks a team of analysts to find and evaluate different means of solving the problem (systems analysis). Their recommendations are presented in ROI terms, and are dealt with during the annual budget review (capital budgeting).

Sales predictions indicate a possible slump (forecasting). A marketing group begins to search for new products (market research), and management accepts the first reasonable alternative that the group finds ("muddling through" manager).

Management discovers a new process for saving time in constructing facilities (entrepreneurial manager). Using the PERT model, these time savings are assessed on a project basis (mathematical modeling). Valuing time, management adopts the new process (entrepreneurial manager).

Table I indicates that there has been little evidence of programming in *intelligence* activity, except, perhaps, in the marketing area. This activity consists primarily of managers finding opportunities and reacting to problems. Search is, by and large, an unprogrammed activity, but there has

been much analytical activity in the evaluation phase of *design* activity. Unless the organization uses capital budgeting, choices

are made informally by managers who satisfy, or who attempt to achieve certain strategy aims.

Table I

	Program	Intelligence Activity (initiating action)	Design Activity (searching and evaluating)	Choice Activity (choosing and integrating)
Manager	"Muddling Through" Manager	Problems forced on manager	Brief search, marginal analysis	First satisfactory alternative chosen; no integration
	Entrepreneurial Manager	Consequential opportunities actively sought by manager	Opportunities compared to vision of strategy	Opportunities chosen which satisfy aims
Planner adaptive	Forecasting	Environmental changes predicted		
	Market Research	Products and markets studied to define marketing opportunities and problems	Consumers studied to find alternatives and determine consumer preferences	
	Systems Analysis		Alternative solutions to individual problems cost/benefit basis	
	Mathematical Modeling		Alternatives tested in simulated environment	
Planner integrative	Capital Budgeting		ROI figures calculated for proposed projects	Highest ROI projects chosen subject to overall budget constraint
	Integrated Strategic Planning	Problems and opportunities identified by studying organizational strengths and weaknesses and environmental trends	Alternatives generated to exploit opportunities and solve problems; alternatives evaluated against stated objectives	Alternatives combined in logical sets for evaluation; set chosen which best satisfies stated objectives

The Present: Conclusions

Planners play a relatively minor role in strategy-making for two reasons:

1. Their programs are loose and ill-defined. In most cases the important work is left to the manager. For example, the manager must define the projects for capital budgeting; he must interrelate the various *ad hoc* market research and systems analysis studies. In other cases, planner methods are no more formal than traditional managerial methods. For example, search is a critical part of any systems analysis study, yet there are no formal search programs. The planner "muddles through."
2. The information necessary for strategy-making flows to the manager. Much of this information — problems, opportunities, pressures, values, opinions, etc. — is unavailable to the planner.

Given the current weaknesses of planning, it must be concluded that a Darwinist evolutionary theory is more realistic than a Biblical "grand plan" theory. Strategy evolves as managers react to stimuli. It is worthwhile to do research on methods of developing integrative plans on a periodic basis, but practitioners must recognize the manager's need to react to problems and pressures as they arise and to be exposed to feedback as problems are gradually solved.

The Future: Recommendations

1. Until we have a fully developed understanding of the manager's strategy-making environment, and until we can develop much stronger integrative programs, planners will find the adaptive programs to be most useful. Let us return to the intelligence-design-choice framework:
 - If the planner can effectively tap the flow of information to the manager, he can be very helpful in the area of *intelligence* activity. Managers lack the time to analyze carefully all the information that bombards them.
 - Search activity, if it is to be effective, is very time-consuming. Planners can play a vital role here, not because of their analytical abilities, but simply because they have the time.
 - Evaluation and choice are highly complex activities. The growth of systems analysis has shown that planners can do an effective

job of evaluation, given that time is available to conduct intricate analyses. However, the planner lacks the formal authority to trade off organizational objectives, and so cannot openly participate in *choice* activity.

2. Planning theorists must now concentrate on studies of current managerial methods. There is a great need to know how managers define problems, how they search for opportunities, and how (and if) they integrate *ad hoc* decisions. Currently the literature offers the reader much more on strategy-making as it should be than as it actually is.

3. The long-run future of the science of strategy-making can best be understood by turning to the past. In 1911, Frederick W. Taylor, referring to the use of analysis in physical work, used a set of arguments which could well have been used in this paper:

It is true that whenever intelligent and educated men find that the responsibility for making progress in any of the mechanic arts rests with them, instead of upon the workmen who are actually laboring at the trade, that they almost invariably start on the road which leads to the development of a science where, in the past has existed mere traditional or rule-of-thumb knowledge. When men, whose education has given them the habit of generalizing and everywhere looking for laws, find themselves confronted with a multitude of problems, such as exist in every other trade and which have a general similarity one to another, it is inevitable that they should try to gather these problems into certain logical groups, and then search for some general laws or rules to guide them in the solution. . . . The workman's whole time is each day taken in actually doing the work with his hands, so that even if he had the necessary education and habits of generalizing in his thought, he lacks the time and the opportunity for developing these laws. . .

Planning foremen of necessity spend most of their time in the planning department, because they must be close to their records and data which they continually use in their work, and because this work requires the use of a desk and freedom from interruption.¹⁴

The development of the field of Industrial Engineering as a direct result of Taylor's urgings stands as a vivid example to those who support the "grand plan" approach today.

¹⁴ See [11], "The Principles of Scientific Management," pp. 103-104 and 123.

References

1. Ansoff, H. Igor. *Corporate Strategy*. New York: McGraw-Hill Book Co., 1965.
2. Anthony, Robert N. *Planning and Control Systems: A Framework for Analysis*. Boston: Division of Research, Graduate School of Business Administration, Harvard University, 1965.
3. Berg, Norman. "Strategic Planning in Conglomerate Companies," *Harvard Business Review*, May-June, 1965, pp. 79-92.
4. Braybrooke, David and Lindblom, Charles E. *A Strategy of Decision*. Glencoe, N. Y.: The Free Press of Glencoe, 1963.
5. Drucker, Peter F. "Entrepreneurship in the Business Enterprise," lecture delivered at the University of Toronto on March 3, 1965. Reprinted in *Commercial Letter*. Toronto: Canadian Imperial Bank of Commerce, March, 1965.
6. Gilmore, Frank F. and Brandenburg, Richard G. "Anatomy of Corporate Planning," *Harvard Business Review*, November-December, 1962, pp. 61-69.
7. Hitch, Charles J. and McKean, Roland N. *The Economics of Defense in the Nuclear Age*. Boston: Harvard University Press, 1960.
8. Leavitt, Theodore. "Marketing Myopia," *Harvard Business Review*, July-August, 1960, pp. 45-56.
9. Simon, Herbert A. *The New Science of Management Decision*. New York: Harper & Row, 1960.
10. Starr, Martin K. "Planning Models," *Management Science*, XIII, 4 (December, 1966), 115-141.
11. Taylor, Fredrick W. *Scientific Management*. New York: Harper & Row, 1947.
12. Tilles, Seymour. "Strategies for Allocating Funds," *Harvard Business Review*, January-February, 1966, pp. 72-80.
13. "Where GE Peers Far into the Future," *Business Week*, September 11, 1965, p. 46.

Henry Mintzberg, S.M., Doctoral Candidate, Sloan School of Management, Massachusetts Institute of Technology. Formerly a consultant with the Department of Industry in the Canadian Government and operations research analyst with the Canadian National Railways.